Site-Specific Safety and Health Plan

Former Ordnance Motor Repair Area, Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)

Final
Site-Specific Safety and Health Plan Attachment
Site Investigation at the Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan
Calhoun County, Alabama
EPA ID No. AL7 210 020 562

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

Delivery Order CK005
Contract No. DACA21-96-D-0018
IT Project No. 774645

December 1998

Revision 1

This Site-Specific Safety and Health Plan must be used in conjunction with the Installation-Wide Safety and Health Plan, Fort McClellan, Alabama.

Final
Site-Specific Safety and Health Plan Attachment Approval
Fort McClellan, Calhoun County, Alabama

I have read and approve this site-specific safety and health plan attachment for the Former Ordnance Motor Repair Area at Fort McClellan, Alabama, with respect to project hazards, regulatory requirements, and IT Corporation procedures.

Jeanne Yacoub, PE
Project Manager

12/30/98
Date

Michael Henderson, CIH
Health & Safety Manager

12/18/98
Date

Jeff Tarr
Site Coordinator

12/30/98
Date

Acknowledgements

The final approved version of this site-specific safety and health plan (SSHP) attachment for the Former Ordnance Motor Repair Area at Fort McClellan, Alabama, has been provided to the site coordinator. I acknowledge my responsibility to provide the site coordinator with the equipment, materials, and qualified personnel to implement fully all safety requirements in this SSHP attachment. I will formally review this plan with the health and safety staff every 6 months until project completion.

Stephen G. Moran for Jeanne Gerard

Project Manager

12/30/98

Date

I acknowledge receipt of this SSHP attachment from the project manager, and that it is my responsibility to explain its contents to all site personnel and cause these requirements to be fully implemented. Any change in conditions, scope of work, or other change that might affect worker safety requires me to notify the project manager and/or the health and safety manager.

Stephen G. Moran

Site Coordinator

12/30/98

Date

Site-Specific Safety and Health Plan
Acknowledgement Form

I have been informed of, and will abide by the procedures set forth in, this site-specific safety and health plan attachment for the activities at the Former Ordnance Motor Repair Area at Fort McClellan, Calhoun County, Alabama.

Printed Name	***Signature***	***Representing***	***Date***

Fort McClellan Gate Hours

Baltzell Gate	Baltzell Road. Open 24 hours daily, 7 days a week.

Fort McClellan Project Emergency Contacts

Fire Department (on post)	Ext. 17
Fire Department (off post)	(256) 820-1117
Ambulance (on post)	Ext. 12
Ambulance (off post)	(256) 848-2315
Military Police (on post)	Ext. 5-3821
Military Police (off post)	(256) 848-5555
Regional Medical Center	(256) 235-5121
Chemical Agent Emergencies	Ext. 17
UXO Emergencies	Ext. 17
UXO Nonemergencies/Reporting Only (Ronald Levy)	(256) 848-3758
National Response Center	(800) 424-8802
Poison Control Center	(800) 462-0800
EPA Region IV	(404) 562-8725
Ronald Levy, Chief, FTMC Environmental Management	(256) 848-3758
Ellis Pope, U.S. Army Corps of Engineers	(334) 690-3077
Jeanne Yacoub, IT Project Manager	(423) 690-3211
Michael Henderson, IT H&S Manager	(423) 690-3211
Dr. Elaine Theriault, IT Occupational Physician	(800) 229-3674

Table of Contents

Page

List of Tables

List of Figures

List of Acronyms

ACM	asbestos-containing material
ADEM	Alabama Department of Environmental Management
BZ	breathing zone
DRMO	Defense Reutilization Marketing Organization
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
FOMRA	Former Ordnance Motor Repair Area
FTMC	Fort McClellan
PPE	personal protective equipment
SHP	installation-wide safety and health plan
SSHO	site safety and health officer
SSHP	site-specific safety and health plan
TCA	trichloroethane
TPH	total petroleum hydrocarbon
TRADOC	U.S. Army Training and Doctrine Command
UST	underground storage tank
VSI	visual site inspection

1.0 Site Work Plan Summary

Project Objective. The objective of this investigation at Fort McClellan (FTMC), Calhoun County, Alabama is to collect and analyze samples from the Former Ordnance Motor Repair Area (FOMRA), Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7).

Project Tasks

- Collect 51 surface soil samples.
- Collect 63 subsurface soil samples.
- Collect 10 sediment samples.
- Collect 10 surface water samples.
- Collect 20 groundwater samples.

Personnel Requirements. Up to ten employees.

Note: All personnel on this site shall have received training, informational programs, and medical surveillance as outlined in the installation-wide safety and health plan (SHP) for site investigations at FTMC, and be familiar with the requirements of this site-specific safety and health plan (SSHP). This SSHP must be used in conjunction with the SHP for FTMC.

2.0 Site Characterization and Analysis

2.1 Anticipated Hazards

The activity hazard analysis in Chapter 5.0 contains project-specific practices utilized to reduce or eliminate anticipated site hazards. The activity hazard analysis indicates specific chemical and physical hazards that may be present and encountered during each task from on-site operations. Below each task is a list of hazards and specific actions that will be taken to control the respective hazards. These control measures may include work practice controls, engineering controls, and/or use of appropriate personal protective equipment (PPE).

The FOMRA consists of two active underground storage tanks (UST) and several buildings. The two active USTs are a 2,500-gallon waste oil tank (Parcel 42[7]) and a 3,000-gallon heating oil tank (Parcel 4[7]). Four USTs have been removed and/or closed in place at the site.

Building 300, the UDQ Transient Building, known as the "Berman House," is located at the southern edge of Parcel 75(7). This building was identified as containing asbestos-containing materials (ACM), but the exposure potential to the ACMs was considered to be low. This facility is used as an officer's residence and is currently scheduled to be demolished during the implementation of Phase 1b of the Preferred Land Use Plan.

Building 303, Parcel 41(7), is a general purpose building located at the FOMRA. A 3,000-gallon heating oil UST is located at the west end of the building. The original UST was removed in 1996 and replaced.

Building 326, Parcel (5), at one time had two USTs, and was possibly a former FTMC gas station. Reportedly, one 500-gallon MOGAS UST and one 500-gallon diesel UST were located as this building. These USTs were removed sometime between 1990 and 1991. However, closure reports for the removal of the USTs are not available.

Building 327 was originally a latrine, and the center wall was later removed. It appears that this building was historically used for storing petroleum products. It is reported that oils and paints were stored in the building and that the floor did not drain well. Oil stains are located on the floor around two drains. This building was observed during the environmental baseline survey (EBS) visual site inspection (VSI) in early 1996. On a subsequent visit to this site in the fall of

1996, this building was found to have burned down. This building was reportedly connected to a 6-inch sanitary sewer line.

Building T-333 is located behind the Radiator Repair Shop, Building 338. Although Building T-333 is no longer present, a building foundation exists with a storm drain in the center. Reportedly, this building stored paint supplies for the paint booth. This building has flooded in the past when the sewer drain backed up. The paint supplies were disposed of as wastes in 1993 or 1994. The flooding is the only reported incident at this building.

Building T-334 was originally a motor pool area, and organized maintenance was performed on military vehicles from an unknown date to 1991. The primary operations were engine change-outs and air-conditioning system repairs. A large all-wheel drive balancing station was located in this building; the building was demolished in 1993 or 1994. The balancing station was back-filled with clean fill, primarily clay. This building had a storm sewer connection, which could have been linked to the oil/water separator; however, the 1946 sewer map does not show the connection. There are not any documented spills or releases at this area.

The fenced compound located between Building T-334 and T-322 was used to store spent solvents and oils used at the Fire Training Pit located across the street. A 1982 report estimated 500 gallons of solvent were stored here in 55-gallon drums. A 1973 aerial photograph shows this fenced area to be unpaved. There are no documented releases at this site.

Building 335, the Small Weapons Repair Shop (Parcel 6[7]), was where weapons, such as the M-16 rifle, were stored after a training exercise. These weapons were disassembled and cleaned using various solutions and solvents, then stored until the next exercise. The building was built in 1941; it is not known when operations began at this location. The operation was moved across the street to the Consolidated Maintenance Facility Building 350 in approximately 1991. Building 335 is now maintained by the Alabama National Guard for boiler plant storage.

Historically, weapons were brought to this repair shop (Building 335), degreased with 1,1,1-trichloroethane (TCA) in a vapor degreaser, and then stripped with a caustic solution. Most degreasing operations now use Safety Kleen7© tanks, and the spent solvents are removed frequently. Blueing/Parkerizing operations were also conducted at the shop. Two older cleaning units remain in the building and are the bead blaster and shot blaster. Neither of these units was used after 1987. These cleaning units have been disconnected from the water and sanitary sewer lines.

Fluids used during the weapons cleaning process are as follows:

- Rinse tank, acid cycle contained water for rinsing weapons after treatment in the phosphate-coating compound (parkerizing) tank and discharged to sanitary sewer.
- Preservative oil tank, acid cycle contained cutting fluid used to treat weapons after treatment with sodium dichromate (blueing). The waste oil was turned over to the Defense Reutilization and Marketing Office (DRMO).
- Rinse tank, plating cycle contained water used to rinse weapons after treatment in black oxide (parkerizing) and discharged to the sanitary sewer.
- Preservative oil, plating cycle contained cutting fluids used to treat weapons after rinse in the water tank. The waste oil was turned over to the DRMO.

On Friday, December 21, 1985, approximately 30 gallons of cutting fluids were released from the building when a drain valve was left open and fluid flowed into a pipe that led to the sanitary sewer system. The pipe had been recently broken or disconnected at a point where it crossed a newly constructed concrete ditch. This ditch drained into nearby Cave Creek near 20th Street. The cutting fluid emulsified with the water in the creek and changed the color of the water milky white for approximately 400 yards downstream of the discharge.

On the following Monday, there was no evidence of emulsified oils, with the exception of a slight sheen on the water. The constituents of the cutting fluid are not listed as hazardous waste under the Resource Conservation and Recovery Act. The results from the analyses indicted that this fluid did not exhibit any characteristics based on corrosivity or extraction procedure toxicity that would qualify it as a hazardous waste. This spill was therefore classified as an oil spill.

A run report indicates that the FTMC Fire Department responded to the spill. The Directorate of Engineering and Housing, U.S. Environmental Protection Agency (EPA), U.S. Army Training and Doctrine Command (TRADOC), and Alabama Department of Environmental Management (ADEM) were notified of this spill. TRADOC and EPA were satisfied that FTMC had implemented appropriate spill response procedures. ADEM responded a week later with approval. The line was later repaired and now runs across the ditch. There was no other documentation on this spill identified.

R. F. Weston, Inc., in a 1990 enhanced preliminary assessment, reported a potential for discharge of phosphoric acid, chromic acid, preservative oils, alkaline solutions, black oxides, and rinse

waters to a storm sewer drain. Upon inspection of sanitary and storm sewer maps during the EBS, it was determined that only a sanitary sewer line runs to the building.

During the EBS VSI, one full unlabeled drum, dated 1991, and two gym lockers filled with paint cans were discovered behind Building 335. Several other unlabeled drums are located inside the main building. The contents and volumes of these drums were not determined because they were placed behind stacks of mattresses and bed frames. Some of the paint cans were rusty and half used; other cans had no labels. Some of the cans had leaked. All of these items had apparently been left by the Alabama National Guard during some work at the building several years before.

Building 336, a small inactive boiler plant, is located adjacent to Building 335, the Small Weapons Repair Shop. This plant has been inactive for some time. There is no other information available concerning dates of operation or past activities at this building.

Building 338 was the Radiator Repair Shop for the FOMRA and was used from an unknown date to 1991. Radiators were drained and either repaired or taken out of service. A paint booth was located in this building and was used to store paint and paint thinners. A lead acid battery maintenance shop was also located in Building 338.

Potential discharges include antifreeze and motor oil. Although a sanitary sewer line is connected to the building, a floor drain discharges to the oil/water separator, which then discharges to the storm sewer. Operations were terminated because the sump located outside the building continually filled with water. The radiator repair operation moved to the Consolidated Maintenance Facility in 1991. This building was connected to the sanitary sewer by a 6-inch line.

The FTMC recycling center moved into Building 338 in 1992 or 1993. The recycling center collects paper, aluminum, glass, and cardboard. One 3,000-gallon heating oil UST (Parcel 42[7]) was identified at this building. Also, as part of the motor pool maintenance operation, a 2,000-gallon waste oil UST was installed at Building 338 in 1982. This UST was closed in place in 1994 and replaced with a 2,500-gallon UST. Soil samples were collected during closure and analyzed for total petroleum hydrocarbon (TPH) and total lead. High levels of TPH were detected in the pipe trench. There was no groundwater sampling conducted at this site. The closure report concluded that a petroleum release had occurred on site and that the vertical and horizontal extent of contamination in the soil had not been determined.

Building 339 was formerly used for motor vehicle repair, but little is known of the former operations at this building. A 1982 memorandum regarding proper turn-in procedures for used batteries instructed all military vehicle users to turn used batteries into Building 339 for inspection. This building is connected to the sanitary sewer. No spills or releases have been documented at this site.

Building 340 was built around 1941 with a baffle-type oil/water separator as part of the Automotive Mechanical Repair Branch. A vehicle wash rack is also located here. This wash rack and oil/water separator facility was rebuilt in 1991 and now has a settling basin attached to a coalescing plate oil/water separator that discharges to the sanitary sewer. It was reported that this wash rack drainage system appeared to be clogged, but the wash rack is not currently being used.

Table 2-1 contains the toxicological and physiological properties of chemicals anticipated or to be used at the FOMRA.

2.2 General Site Information

Location of Site. The FOMRA, Parcel 75(7) is located central on the Main Post. The site is bordered by 18th Street on the north side, 20th Street on the south side, and 5th Avenue on the west. The new Consolidated Maintenance Facility is located across the street (east) from the site. The FOMRA site covers approximately 40 acres.

Duration of Planned Employee Activity. Employee activity duration is 1 month.

Site Topography. The site elevation ranges from approximately 775 to 800 feet.

Pathways for Hazardous Substance Dispersion. Possible pathways for hazardous substances in the area are groundwater, surface water, soils, and sediment.

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Acetone [67-64-1]	9.7	13-100	Inh Ing Con	Irritated eyes, nose, and throat; headache, dizziness; dermatitis.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	750 ppm 750 ppm 250 ppm	1,000 ppm 1,000 ppm	PEL TLV REL	20,000 ppm
Benzene [71-43-2]	9.24	34-119	Inh Abs Ing Con	Irritates eyes, nose, respiratory system; giddiness; headache, nausea, staggered gait; fatigue, anorexia, lassitude; dermatitis; bone-marrow depression. Carcinogenic.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	1 ppm (10 ppm) NIC-0.1 skin 0.1 ppm	5 ppm C1 ppm (Ca)	PEL TLV REL	Ca [1,000 ppm]* *OSHA
Chromic acid	NA	NA	Inh Ing Con	Irritated respiratory system; perforated nasal system; liver, kidney damage, eye injury, skin ulceration.	Eye: Irrigate immediately Skin:: Soap flush immediately Breath: Respiratory support Swallow: Immediate medical attention	-- 0.1 mg/m^3	C 0.1 mg/m^3 --	PEL TLV REL	
Ethanol	9.51	NA	Inh Ing Con	Irritated eyes, skin, nose; headache; cough, liver damage; anemia.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	1,000 ppm 1,000 ppm 1,000 ppm	-- -- --	PEL TLV REL	3,300 ppm (LEL)
Ethyl benzene [100-41-4]	8.76	0.09-0.6	Inh Ing Con	Irritates eyes, mucous membranes; headache; dermatitis; narcosis, coma.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	125 ppm 125 ppm 125 ppm	PEL TLV REL	2,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Fuel Oil (diesel oil, medium)	?	?	Ing Inh Con	Ingestion causes nausea, vomiting, and cramps; depressed central nervous system, headache, coma, death; pulmonary irritation; kidney and liver damage; aspiration causes severe lung irritation, coughing, gagging, dyspnea, sub-sternal stress, pulmonary edema; bronchopneumonia; excited, then depressed, central nervous system.	Eye: Irrigate promptly Skin: Soap wash Breath: Respiratory support Swallow: Immediate medical attention Aspiration: Immediate medical attention			PEL TLV REL	
Fuel Oil No. 1, see kerosene. [NA]								PEL TLV REL	
Fuel Oil No. 2, see fuel oil. [NA]								PEL TLV REL	
Fuel Oils No. 4, 5, and 6 [NA]	?	?	Abs Con	Low toxicity; prolonged contact may produce systemic effects.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Kerosene	?	?	Inh Ing Con	Irritation to eyes, skin, nose, throat; burning sensation in chest; nausea; weakness; headache; confusion; drowsiness; vomiting; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 mg/m^3		PEL TLV REL	
Gasoline [8006-61-9]	?	0.3	Inh Ing Con	Intoxication, headaches, blurred vision, dizziness, nausea; eye, nose throat irritation; potential kidney and other cancers. Carcinogenic.	Eye: Irrigate immediately (15 min) Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	300 ppm 300 ppm Ca, lowest feasible conc. (LOQ 15 ppm)	500 ppm 500 ppm	PEL TLV REL	?
n-Hexane [110-54-3]	10.18	65-248	Inh Ing Con	Lightheadedness; nausea, headache; numbness of the extremities, muscular weakness; irritation of the eyes and nose; dermatitis; chemical pneumonia; giddiness.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	50 ppm 50 ppm 50 ppm		PEL TLV REL	5,000 ppm
Hydrogen Chloride (hydrochloric acid) [74-90-8]	12.74	0.255-10.6	Inh Ing Con	Inflamed nose, throat, larynx; cough, burns throat, choking; burns eyes, skin; dermatitis; in animals; laryngeal spasm; pulmonary edema.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C5 ppm C5 ppm C5 ppm	PEL TLV REL	100 ppm
Isopropyl Alcohol (isopropanol) [67-63-0]	10.16	43-200	Inh Ing Con	Mild irritation of the eyes, nose, and throat; drowsiness, dizziness, headache; dry, cracked skin.	Eye: Irrigate immediately Skin: Water flush Breath: Respiratory support Swallow: Immediate medical attention	400 ppm 400 ppm 400 ppm	500 ppm 500 ppm 500 ppm	PEL TLV REL	12,000 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Lead	NA	NA	Inh Ing Con	Weak, insomnia, facial pallor, constipated, abdominal pain, colic, anemia, irritated eyes, paralysis of wrists and ankles, encephalopathy.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention		0.05 mg/m 0.05 mg/m 0.1 mg/m	PEL TLV REL	100 mg/m
Methanol	10.85	4.2-5960	Inh Abs Ing Con	Irritated eyes, headache, drowsiness, lightheadedness, nausea, vomiting, disturbance in vision, blindness.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention		200 ppm (skin) 200 ppm (skin) 200 ppm	PEL TLV REL	25,000 ppm
Methylene Chloride (dichloromethane) [75-09-2]	11.32	?	Inh Ing Con	Fatigue, weakness, sleepiness, lightheadedness; numbness and tingling in limbs; nausea; irritated eyes and skin.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 50 ppm	C1,000 ppm; C2,000 mg/m^3 (5 min in 2 hrs)	PEL TLV REL	Ca (5,000 ppm)
Methyl Ethyl Ketone [78-93-3]	9.54	2-85	Inh Ing Con	Irritated eyes and nose; headache, dizziness; vomiting.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Fresh air Swallow: Immediate medical attention	200 ppm 200 ppm 200 ppm	300 ppm 300 ppm 300 ppm	PEL TLV REL	3,000 ppm
Motor Oil [NA]	?	?	Inh Ing	Irritated eyes, skin, respiratory system; usually only a problem if misted or ingested.	Eye: Irrigate immediately (15 min) Skin: Soap wash immediately Swallow: Immediate medical attention			PEL TLV REL	
Naptha, see petroleum distillate									

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Nitric Acid [7697-37-2]	11.95	0.3-1	Inh Ing Con	Irritated eyes, mucous membranes, and skin; delayed pulmonary edema, pneumonitis, bronchitis; dental erosion.	Eye: Irrigate immediately Skin: Water flush promptly Breath: Respiratory support Swallow: Immediate medical attention	2 ppm 2 ppm 2 ppm	4 ppm 4 ppm 4 ppm	PEL TLV REL	100 ppm
Petroleum Distillate (Naptha) [8002-05-9]	?	?	Con Ing	Coughing, dyspnea, nausea, or vomiting.		400 ppm		PEL TLV REL	
Petroleum Hydrocarbons, see Stoddard solvent									
Phosphoric Acid	NA	NA	Inh Ing Con	Irritated eyes, skin, upper respiratory system; dermatitis; eye and skin burns.	Eye: Irrigate immediately Skin: Water flush wash immediately Breath: espiratory support Swallow: Immediate medical attention	1 mg/m^3 1 mg/m^3 1 mg/m^3	3 mg/m^3 3 mg/m^3	PEL TLV REL	1,000 mg/m^3
Portland Cement			Inh	Fine gray powder that can be irritating if inhaled or in eyes.	Eye: Irrigate immediately Skin: Soap wash Immediately Breath: Respiratory support Swallow: Immediate medical attention		10 mg/m^3 10 mg/m^3/ total dust 5 mg/m^3 respirable fraction	TLV PEL/REL	

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Sodium Hydroxide (caustic soda, lye) [1310-73-2]	NA	NA	Inh Ing Con	Irritated nose; pneumonitis; burns eyes, and skin; temporary loss of hair.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention		C2 mg/m^3 C2 mg/m^3 C2 mg/m^3	PEL TLV REL	250 mg/m^3
Sulfuric Acid [7664-93-9]	?	0.15	Inh Ing Con	Irritated eyes, nose, and throat; pulmonary edema, bronchitis; emphysema; conjunctivitis; stomatitis; dental erosion; tracheobronchitis; skin and eye burns; dermatitis.	Eye: Irrigate immediately Skin: Water flush immediately Breath: Respiratory support Swallow: Immediate medical attention	1 mg/m^3 1 mg/m^3 1 mg/m^3	3 mg/m^3	PEL TLV REL	80 mg/m^3
Stoddard Solvent	?	?	Inh Ing Con	Irritated eyes, nose, and throat; dizziness; dermatitis; chemical pneumonia.	Eye: Irrigate immediately Skin: Soap wash immediately Breath: Respiratory support Swallow: Immediate medical attention	500 ppm 350 mg/m^3		PEL TVL REL	20,000 mg/m^3
Toluene [108-88-3]	8.82	0.16-37	Inh Abs Ing Con	Fatigue, weakness; confusion, euphoria, dizziness, headache; dilated pupils, lacrimation; nervousness, muscular fatigue, insomnia; paralysis; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 50 ppm (skin) 100 ppm	150 ppm 150 ppm	PEL TLV REL	2,000 ppm
1,1,1-Trichloroethane [71-55-6]	11.00 eV	?	Inh Ing Con	Irritated eyes, skin; headache; CNS depression; poor equilibrium; dermatitis; cardia arrhytharias ; liver damage.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	350 ppm 350 ppm --	450 ppm C 350 ppm	PEL TLV REL	700 ppm

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Substance [CAS]	IP[a] (eV)	Odor Threshold (ppm)	Route[b]	Symptoms of Exposure	Treatment	TWA[c]	STEL[d]	Source[e]	IDLH (NIOSH)[f]
Xylene (o-, m-, and p-isomers) [1330-20-7;95-47-6; 108-38-3;106-42-3]	8.56/ 8.56/ 8.44	1.1–20	Inh Abs Ing Con	Dizziness, excitement, drowsiness, incoordination, staggering gait; irritated eyes, nose, throat; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis.	Eye: Irrigate immediately Skin: Soap wash promptly Breath: Respiratory support Swallow: Immediate medical attention	100 ppm 100 ppm 100 ppm	150 ppm 150 ppm 150 ppm	PEL TLV REL	1,000 ppm

[a]IP = Ionization potential (electron volts).
[b]Route = Inh, Inhalation; Abs, Skin absorption; Ing, Ingestion; Con, Skin and/or eye contact.
[c]TWA = Time-weighted average. The TWA concentration for a normal work day (usually 8 or 10 hours) and a 40-hour work week, to which nearly all workers may be repeatedly exposed, day after day without adverse effect.
[d]STEL = Short-term exposure limit. A 15-minute TWA exposure that should not be exceeded at any time during a workday, even if the TWA is not exceeded.
[e]PEL = Occupational Safety and Health Administration (OSHA) permissible exposure limit (29 CFR 1910.1000, Table Z).
AEL = Airborne Exposure Limit.
TLV = American Conference of Governmental Industrial Hygiene (ACGIH) threshold limit value—TWA.
REL = National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit.
[f]IDLH (NIOSH)—Immediately dangerous to life or health (NIOSH). Represents the maximum concentration from which, in the event of respirator failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impairing or irreversible health effects.
NE = No evidence could be found for the existence of an IDLH (NIOSH Pocket Guide to Chemical Hazards, Pub. No. 97-140, 1997).
C = Ceiling limit value which should not be exceeded at any time.
Ca = Carcinogen.
NA = Not applicable.
? = Unknown.
LEL = Lower explosive limits.
LC_{50} = Lethal concentration for 50 percent of population tested.
LD_{50} = Lethal dose for 50 percent of population tested.
NIC = Notice of intended change (ACGIH).

Table 2-1

Toxicological and Physical Properties of Chemicals
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

References:

American Conference of Governmental Industrial Hygienists Guide to Occupational Exposure Values, 1998, compiled by the American Conference of Governmental Industrial Hygienists.
Amoore, J. E. Hautula, "Odor as an Aid to Chemical Safety," Journal of Applied Toxicology, 1983.
Clayton, George D., Clayton, F. E., Patty's Industrial Hygiene and Toxicology, 3rd ed., John Wiley & Sons, New York.
Documentation of TLVs and BEIs, American Conference of Governmental Industrial Hygienists, 6th ed., 1998.
Fazzuluri, F. A., Compilation of Odor and Taste Threshold Values Data, American Society for Testing and Materials, 1978.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, CIVO, Netherlands, 1977.
Gemet, L. J. Van, Compilation of Odor Threshold Values in Air and Water, Supplement IV, CIVO, Netherlands, 1977.
Lewis, Richard J., Sr., 1992, Sax's Dangerous Properties of Industrial Materials, 8th ed., Van Nostrand Reinhold, New York.
Micromedex Tomes Plus (R) System, 1992, Micromedex, Inc.
National Institute for Occupational Safety and Health Pocket Guide to Chemicals, Pub. No. 97-140, 1997, National Institute for Occupational Safety and Health.
Odor Threshold for Chemicals with Established Occupational Health Standards, American Industrial Hygiene Association, 1989.
Respirator Selection Guide, 3M Occupational Health and Safety Division, 1993.
Verschuseren, K., Handbook of Environmental Data on Organic Chemicals, Van Nostrand and Reinhold, 1977.
Warning Properties of Industrial Chemicals—Occupational Health Resource Center, Oregon Lung Association.
Workplace Environmental Exposure Levels, American Industrial Hygiene Association, 1992.

3.0 Personal Protective Equipment

The work activities will begin in the following levels of protection. Also, a completed description of Level D, Modified Level D, and Level C PPE is provided.

Task	Initial Level of PPE
Staging equipment	Level D
Collecting samples	Modified Level D*

*Initial level will be raised to Level C or higher if air monitoring results in the worker's breathing zone (BZ) are greater than action levels.

Level D. The minimal level of protection that will be required of IT Corporation personnel at the site will be Level D. The following equipment will be used for Level D protection:

- Coveralls or work clothing
- Leather work gloves (when necessary)
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Modified Level D. The following equipment will be used for Level D-Modified protection:

- Permeable Tyvek, Kleenguard, or its equivalent (Saran-coated tyvek where chemical agents are anticipated)
- Latex boot covers
- Nitrile, heavy work, or latex gloves
- Steel-toed safety boots
- Safety glasses
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to modifying Level D PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

Level C. Level C protection will not be used unless air-monitoring data indicate the need for upgrade; however, the equipment shall be readily available on site. The following equipment will be used for Level C protection:

- National Institute of Occupational Safety and Health/Mine Safety and Health Administration-approved full-face, air-purifying respirators equipped with organic vapor/acid gas cartridge in combination with high-efficiency particulate air filter
- Hooded, Saran-coated Tyvek, taped at gloves, boots, and respirator
- Nitrile gloves (outer)
- Latex or lightweight nitrile gloves (inner)
- Neoprene steel-toed boots or polyvinyl chloride overbooties/steel-toed safety boots
- Hard hat
- Hearing protection (when working near/adjacent to operating equipment).

Note: In addition to Level C PPE, the operator of high-pressure water jetting equipment shall wear metatarsal guards for the legs and feet.

4.0 Site Monitoring

The environmental contaminants of concern resulting from FOMRA operations are diesel fuels, gasoline, benzene, toluene, ethyl benzene, xylene, 1,1,1-TCA, phosphoric acid, chromic acid, and lead. Table 4-1 contains action levels for site monitoring at the FOMRA.

Monitoring will be performed by the site safety and health officer (SSHO) during the performance of ground intrusive operations. A calibrated flame ionization detector (i.e., OVA 128 or equivalent) organic vapor analyzer will be utilized to monitor the sampling locations and BZs to determine if any organic material may be present that would necessitate upgrading of protection level. A calibrated combustible gas/oxygen indicator will be utilized to monitor the sampling location and BZs for combustible/flammable gas and oxygen levels that would necessitate evacuation of the work area. Table 4-2 contains the air monitoring frequency and location for site monitoring at the FOMRA.

Table 4-1

Action Levels
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

When in Level C Personal Protective Equipment (PPE)

Analyte	Action Level	Required Action[a]
VOHs	≥ 10 ppm above background in breathing zone (BZ)	Stop work, evacuate work area, upgrade to Level B.
Benzene	≥ 5 ppm in BZ	Stop work, evacuate work area, upgrade to Level B.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% lower explosion limit (LEL) < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for volatile organic compounds (VOC).

When in Level D Modified/D PPE

Analyte	Action Level	Required Action[b]
VOHs	≥ 5 ppm above background in BZ	Stop activities, suspend work activities for 15 to 30 minutes, if readings are sustained then upgrade to Level C PPE.
Benzene	1 ppm in BZ	Upgrade to Level C PPE.
Oxygen	≥ 20%, <23% < 20%, >23%	Normal operations. Stop work, evacuate work area.
Flammable vapors	≥ 10% LEL < 10% LEL	Stop work, evacuate work area. Continue operations, monitor for VOCs.

Table 4-1

Action Levels
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

When in Support Zone

Analyte	Action Level	Required Action
VOHs	≥ 1 ppm above background in BZ	Evacuate support zone and re-establish perimeter of exclusion zone.

[a] Four instantaneous peaks in any 15-minute period or a sustained reading for 5 minutes in excess of the action level will trigger a response.

[b] Contact with the H&S manager must be made prior to continuance of work. The H&S manager may then initiate perimeter/integrated air sampling along with additional engineering controls.

No one is permitted to downgrade levels of PPE without authorization from the H&S manager.

Table 4-2

Air Monitoring Frequency and Location
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Work Activity	Instrument	Frequency	Location
Staging equipment	OV Monitor	Initially for area	Breathing zone (BZ) of employees
Sampling (groundwater, surface water, sediment, and soil)	OV Monitor LEL/O_2 Monitor	Continuously Continuously	BZ of employees Support zone

OV = Organic vapor.
LEL/O_2 = Lower explosive level/oxygen.

5.0 Activity Hazard Analysis

The attached activity hazard analysis (Table 5-1) is provided for the following activities:

- Setup of equipment and general field activities
- Soil, sediment, groundwater, and surface water sampling.

All injuries and illnesses must be immediately reported to the site manager or the SSHO, who will then notify off-site personnel and organizations as necessary.

If hospital care must be provided, the victim shall be treated at Northeast Regional Medical Center. Directions to the hospital are provided in Figure 1-1.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging Equipment	Slip, trip, and fall hazards	• Determine best access route before transporting equipment. • Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards. • Look before you step; ensure safe and secure footing.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment.
	Falling objects	• Stay alert and clear of materials suspended overhead; wear hard hat and steel-toed boots.
	Flying debris, dirt, dust, etc.	• Wear safety glasses/goggles; ensure that eye wash is in proper working condition.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cuts/bruises	• Use cotton or leather work gloves for material handling.
	Bees, spiders, and snakes	• Inspect work area carefully and avoid placing hands and feet into concealed areas.
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Fire	• Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Hazard communication	• Label all containers as to contents and dispose of properly. • Ensure Material Safety Data Sheets (MSDS) are available for hazardous chemicals used on site.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging Equipment (continued)	Noise	• Sound levels above 85 decibels (dBA) mandates hearing protection.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40 degrees Fahrenheit (°F). • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the "buddy system." • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging Equipment (continued)	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.
	Contact with moving equipment/vehicles	• Work area will be barricaded/demarcated. • Equipment will be laid out in an area free of traffic flow. • Barricades shall be used on or around work areas when it is necessary to prevent the inadvertent intrusion of pedestrian traffic. • Barriers shall be used to protect workers from vehicular traffic. • Barriers shall be used to guard excavations adjacent to streets or roadways. • Flagging shall be used for the short term (less than 24 hours) to identify hazards until proper barricades or barriers are provided. • Heavy equipment shall have backup alarms.
	Forklift operations	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Portable electric tools	• Portable electric tools that are unsafe due to faulty plugs, damaged cords, or other reasons, shall be tagged (do not use) and removed from service. • Portable electric tools and all cord and plug connected equipment shall be protected by a ground-fault circuit interrupter (GFCI) device. • Electrical tools shall be inspected daily prior to use.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Staging Equipment (continued)	Extension cords	• Extension cords that have faulty plugs, damaged insulation, or are unsafe in any way shall be removed from service. • Cords shall be protected from damage from sharp edges, projections, pinch points (doorways), and vehicular traffic. • Cords shall be suspended with a nonconductive support (rope, plastic ties, etc,). • Cords shall be designed for hard duty. • Cords shall be inspected daily.
	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one. • Keep all body parts in contact with the ground as close as possible. • Remain 6 feet away from tree trunk if seeking shelter beneath tree(s). • If in a group, keep 6 feet of distance between people.
	Thunderstorms, tornados	• Listen to radio or TV announcements for pending weather information. • Cease field activities during thunderstorm or tornado warnings. • Seek shelter. Do not try to outrun a tornado.
Surveying	Slip, trip, and fall hazards	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe boots when working in the field. • Provide adequate lighting in all work areas. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls. • Work areas will be kept clean and orderly. • Garbage and trash will be disposed of daily in approved refuse containers. • Tools and accessories will be properly maintained and stored. • Work areas and floors will be kept free of dirt, grease, and slippery materials.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Surveying (continued)	Traffic accidents	• Place physical barrier (i.e., barricades, fencing) around work areas regularly occupied by pedestrians. • If working adjacent to roadways, have workers wear fluorescent orange vests. • Use warning signs or lights to alert oncoming traffic. • Assign flag person(s) if necessary to direct local traffic. • Set up temporary parking locations outside the immediate work area. • Motor vehicle operators shall obey all posted traffic signs, signals, and speed limits. • Pedestrians have the right-of-way. • Wear seat belts when vehicles are in motion.
	Wildlife hazards	• Workers should be cautious when driving through the site in order to avoid encounters with passing animals.
	Biological hazards	• Walking through overgrown grass areas, watch for snakes (rattlesnakes, moccasins, copperheads).
	Ticks	• Wear light colored clothing (can see ticks better). • Mow vegetated and small brush areas. • Wear insect repellant. • Wear long sleeves and long pants. • Visually check oneself promptly and frequently after exiting the work area.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Groundwater Sampling	Cross-contamination and contact with potentially contaminated materials	• Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Avoid skin contact with water. • Handle samples with care. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Hazard communication	• MSDSs shall be obtained for chemicals brought on site. • Label all containers as to contents.
	Strains/sprains	• Use the proper tool for the job being performed. • Get assistance if needed. • Avoid twisting/turning while pulling on tools, moving equipment, etc.
	Spills/residual materials	• Absorbent material and containers will be kept available where leaks or spills may occur.
	Lighting	• Adequate lighting will be provided to ensure a safe working environment.
	Unattended worker	• Use "buddy system" - visual contact will be maintained with the sampling technician during sampling activities.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
	Slip, trip, and fall hazards	• Site workers will be required to wear hard hat, safety glasses with side shields, work gloves, and steel-toe/shank boots when working in the field. • Whenever possible, avoid routing cords and hoses across walking pathways. • Flag or cover inconspicuous holes to protect against falls.
	Bees, spiders, and snakes	• Workers shall inspect the work area carefully and avoid placing hands and feet into concealed areas. • Evaluate need for sensitive workers to have prescribed antibiotic or medicine to combat onset of symptoms.
	Poison ivy/oak/sumac	• Avoid plant areas if possible. • Wear long sleeves and long pants. • Promptly wash clothing that has contacted poisonous plants. • Wash affected areas immediately with soap and water.
	Cold stress	• Workers should wear insulated clothing when temperatures drop below 40°F. • Drink warm beverages on breaks. Refrain from drinking caffeinated beverages. • Remove wet clothing promptly. • Take breaks in warm areas. • Reduce work periods as necessary. • Layer work clothing.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (continued)	Access/egress hazards	• Use qualified and trained bushhog operator. • Keep employees out of the bushhog work area. • Utilize good housekeeping practices. • Keep aisleways, pathways, and work areas free of obstruction. • Clean ice or snow off of walkways or work stations. • Use appropriate footwear for the task assigned.
	Heat rash	• Keep the skin clean and dry. • Change perspiration-soaked clothing, as necessary. • Bathe at end of work shift or day. • Apply powder to affected area.
	Heat cramps	• Drink plenty of cool fluids even when not thirsty. • Provide cool fluid for work crews. • Move victim to shaded, cool area.
	Heat exhaustion	• Conduct physiological worker monitoring as needed (i.e., heart rate, oral temperature). • Set up work/rest periods. • Use the buddy system. • Allow workers time to acclimate. • Have ice packs available for use. • Take frequent breaks.
	Heat stroke	• Evaluate possibility of night work. • Perform physiological monitoring on workers during breaks. • Wear body cooling devices.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Soil Boring and Surface/Subsurface Sampling (continued)	Lightning strikes	• Whenever possible, halt activities and take cover. • If outdoors, stay low to the ground. • Limit the body surface area that is in contact with the ground (i.e., kneeling on one knee is better than laying on the ground). • Seek shelter in a building if possible. • Stay away from windows. • If available, crouch under a group of trees instead of one single tree. • Keep all body parts in contact with the ground as close as possible. • If in a group, keep 6 feet of distance between people.
Surface Water/Sediment Sampling	Drowning	• Personal flotation devices (PFD) will be provided and worn by workers over or near water where the danger of drowning exists. • PFDs shall be inspected prior to and after each use. • Detective PFDs will be tagged and removed from service. • Ring buoys with at least 90 feet of line shall be provided and readily available at locations where employees are working over or adjacent to water. • Use the "buddy system." • Personnel trained in launching and operating the skiff shall be readily available during work hours.
Moving and Shipping Collected Samples	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Pinch points	• Keep hands, fingers, and feet clear of moving/suspended materials and equipment. • Beware of contact points. • Stay alert at all times!
	Cut hazards	• Wear adequate hand protection. Use care when handling glassware.
	Hazard communication	• Label all containers as to contents and associated hazards.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Material Storage	Flammable and combustible liquids	• Store in NO SMOKING AREA. • Fire extinguisher readily available. • Transfer only when properly grounded and bonded.
Disposal of Investigation-Derived Waste (IDW) (Forklift Operation)	Personnel injury, property damage, and/or equipment damage	• Use qualified and trained forklift operators. • The operator shall not exceed the load capacity rating for the forklift. • The load capacity shall be clearly visible on the forklift. • Forklift operators shall inform their supervisor of any prescribed medication that they are taking that would impair their judgement.
	Cross-contamination and contact with potentially contaminated materials	• Stop immediately at any sign of obstruction. • Sampling technicians will wear proper protective clothing and equipment to safeguard against potential contamination. • Only essential personnel will be in the work area. • Real-time air monitoring will take place before and during sampling activities. • All personnel will follow good hygiene practices. • Proper decontamination procedures will be followed. • All liquids and materials used for decontamination will be contained and disposed of in accordance with federal, state, and local regulations.
	Cut hazards	• Use care when handling glassware. • Wear adequate hand protection.
High-Pressure Water Jetting Operations	Heavy lifting	• Use proper lifting techniques. • Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	• Good housekeeping shall be implemented. • The work area shall be kept clean as feasible. • Inspect the work area for slip, trip, and fall hazards.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Fueling	• Only approved safety cans shall be used to store fuel. • Do not refuel equipment while it is operating. • Fire extinguishers shall be suitably placed, distinctly marked, readily accessible, and maintained in a fully charged and operable condition.
	Faulty or damaged equipment	• Equipment shall be inspected before being placed into service and at the beginning of each shift. • Preventive maintenance procedures recommended by the manufacturer shall be followed. • A lockout/tagout procedure shall be used for equipment found to be faulty or undergoing maintenance.
	High-pressure water	• Jetting gun operator must wear appropriate PPE including hard hat, impact-resistant safety glasses with side shields, water-resistant clothing, metatarsal guards for feet and legs, and hearing protection (if appropriate). • One standby person shall be available within the vicinity of the pump during jetting operation. • The work area shall be isolated and adequate barriers will be used to warn other site personnel.
	Unqualified operators	• Only qualified and trained personnel are permitted to operate machinery and mechanized equipment associated with water jet cutting and cleaning.
	Out of control equipment	• No machinery or equipment is permitted to run unattended. • Machinery or equipment will not be operated in a manner that will endanger persons or property nor will the safe operating speeds or loads be exceeded.
	Noise	• Sound levels above 85 dBA mandates hearing protection by nearby site personnel.
	Activation during repairs	• All machinery or equipment will be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being done.
	Pinch points	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert and clear of materials suspended .
	Falling objects	• Hard hats are required by site personnel. • Stay alert and clear of material suspended overhead.
	Flying debris	• Impact-resistant safety glasses with side shields are required.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
High-Pressure Water Jetting Operations (continued)	Contact with potentially contaminated materials	• All site personnel will wear the appropriate PPE.
Hydropunch Sampling	Faulty or damaged equipment being utilized to perform work	• All machinery or mechanized equipment will be inspected by a competent mechanic and certified to be in safe operating condition. • Equipment will be inspected before use and at the beginning of each shift. • Faulty/unsafe equipment will be tagged and, if possible, locked out. • Drill rigs shall be equipped with reverse signal alarm, backup warning lights, or the vehicle is backed up only when an observer signals it is safe to do so.
	Uneven terrain, poor ground support, inadequate clearances, contact with utilities	• Inspections or determinations of road conditions and structures shall be made in advance to ensure that clearances and load capacities are safe for the passage or placing of any machinery or equipment. • All mobile equipment and areas in which they are operated shall be adequately illuminated. • Whenever the equipment is parked, the parking brake shall be set. • Equipment parked on inclines will have the wheels chocked. • Inspect brakes and tire pressure on drill rig before staging for work. • Obtain trenching/drilling permit prior to operation.
	Inexperienced operator	• Machinery and mechanized equipment shall be operated only by designated personnel. • Heavy equipment operators shall inform their supervisor(s) of any prescribed medication that they are taking that would impair their judgement.
	Jacks/outriggers	• Ensure proper footing and cribbing.
	Falling objects	• Remove unsecured tools and materials before raising or lowering the derrick. • Stay alert and clear of materials suspended overhead.

Table 5-1

Activity Hazard Analysis
Former Ordnance Motor Repair Area
Parcels 75(7), 41(7), 42(7), 5(7), 6(7), and 66(7)
Fort McClellan, Calhoun County, Alabama

Activity	Potential Hazards	Recommended Controls
Hydropunch Sampling (continued)	Pinch points	• Keep feet and hands clear of moving/suspended materials and equipment. • Stay alert at all times!
	Fire	• Mechanized equipment shall be shut down prior to and during fueling operations. • Have fire extinguishers inspected and readily available.
	Fall hazards	• Personnel are not allowed to work off of machinery or use them as ladders. • Use fall protection when working above 6 feet.
	Noise	• Hearing protection is mandatory above 85 dBA.
	Contact with rotating or reciprocating machine part	• Use machine guards; use long-handled shovels to remove auger cuttings. • Safe lockout procedures for maintenance work.
	Heavy lifting	• Use proper lifting techniques. Lifts greater than 60 pounds require assistance or mechanical equipment; size up the lift.
	Slip, trip, and fall hazards	• Practice good housekeeping; keep work area picked up and clean as feasible. • Continually inspect the work area for slip, trip, and fall hazards.
	Contact with potentially contaminated materials	• Real time air monitoring will take place. If necessary, proper personal protective clothing and equipment will be utilized.

PELHAM RANGE

MAIN POST

CHOCCOLOCCO CORRIDOR

OLD WATER HOLE

RANGE K

RANGE L

RANGE J

GATE 1

GATE 2

GATE 3

GATE 4

BALTZELL GATE

SUMMERAL GATE

GALLOWAY GATE

LANDFILL NO. 1

LANDFILL NO. 2

LANDFILL NO. 3

U.S. ARMY NOBLE HOSPITAL

STUMP DUMP

FORMER SMOKE AREA SOUTH SLOPE MORGAN MOUNTAIN

FORMER SMOKE AREA CHOCCOLOCCO CORRIDOR

GROUND SCAR WITH PROBABLE TRENCHES AT DRIVING COURSE

RANGE 24A FOG OIL DRUM STORAGE

NORTHEAST ALABAMA REGIONAL MEDICAL CENTER

LEGEND:

- ROUTE TO NORTHEAST ALABAMA REGIONAL MEDICAL CENTER
- U.S. HIGHWAY
- HOSPITALS
- INVESTIGATION SITES

NOT TO SCALE

FIRE DEPT. PHONE NUMBER: (205) 848-5936

SCALE

0 8000 16000 FEET

FIGURE 1
HOSPITAL EMERGENCY ROUTES

U. S. ARMY CORPS OF ENGINEERS
MOBILE DISTRICT
FORT McCLELLAN
CALHOUN COUNTY, ALABAMA
Contract No. DACA21-96-D-0018

INTERNATIONAL TECHNOLOGY CORPORATION

DRAFT. CHCK. BY:
ENGR. CHCK. BY: A. MAYILA
INITIATOR: A. MAYILA
PROJ. MGR: J. YACOUB
DWG. NO: ...4645es.218
PROJ. NO: 774645
DATE LAST ...
DRAWN BY:
STARTING DATE: 8/26/98
DRAWN BY: D. BILLINGSLEY
19 NOV 98 14:09:33
C:\MDS\Civil\774645es.218
mcraft